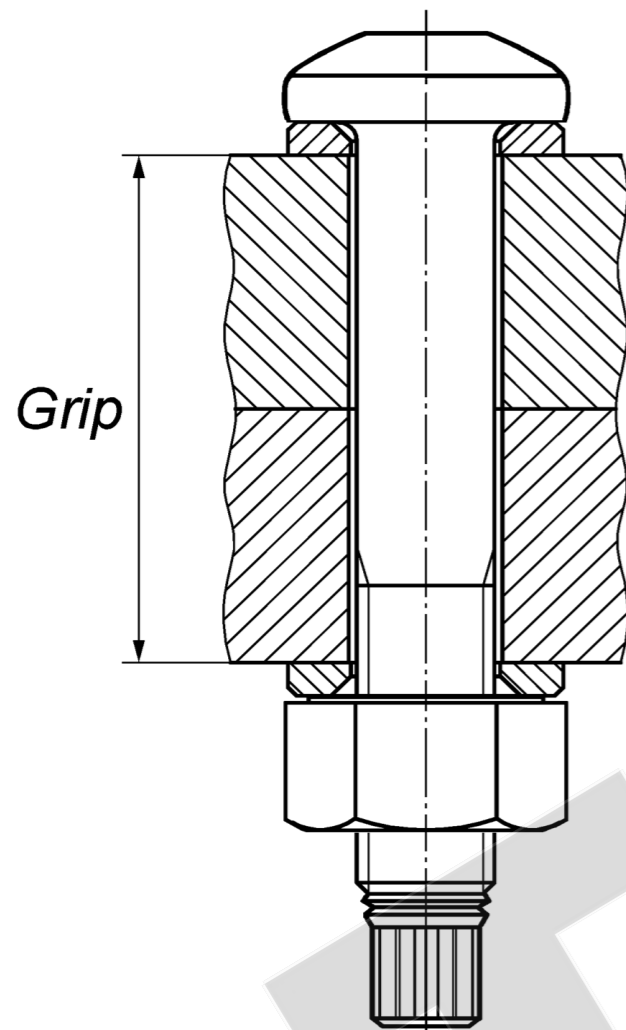


Grip Tolerances for TCBs (HRD Nut + 2 Washers) and a Standard Shear Wrench



BOLT SIZE	MIN	MAX
M12 X 30	4	8
M12 X 35	4	13
M12 X 40	4	18
M12 X 45	10	23
M12 X 50	15	28
M12 X 55	20	33
M12 X 65	30	43
M12 X 75	40	53
M12 X 85	50	63
M12 X 95	60	73
M12 X 105	70	83

M16 X 40	4	12
M16 X 45	4	17
M16 X 50	6	22
M16 X 55	11	27
M16 X 60	16	32
M16 X 65	21	37
M16 X 70	26	42
M16 X 75	31	47
M16 X 80	36	52
M16 X 90	46	62
M16 X 100	56	72
M16 X 110	66	82
M16 X 120	76	92
M16 X 130	83	102
M16 X 140	93	112
M16 X 150	103	122
M16 X 160	113	132
M16 X 170	123	142

BOLT SIZE	MIN	MAX
M20 X 50	10	17
M20 X 55	10	22
M20 X 60	10	27
M20 X 65	13	32
M20 X 70	20	37
M20 X 75	23	42
M20 X 80	30	47
M20 X 85	35	52
M20 X 90	40	57
M20 X 95	45	62
M20 X 100	50	67
M20 X 105	55	72
M20 X 110	60	77
M20 X 115	65	82
M20 X 120	70	87
M20 X 125	75	92
M20 X 130	77	97
M20 X 135	82	102
M20 X 140	87	107
M20 X 150	97	117
M20 X 160	107	127
M20 X 170	117	137
M20 X 185	132	152
M20 X 200	147	167
M20 X 220	167	187

M22 X 55	8	18
M22 X 60	8	23
M22 X 65	11	28
M22 X 70	16	33
M22 X 75	-4	38
M22 X 80	26	43
M22 X 85	31	48
M22 X 90	36	53
M22 X 95	41	58
M22 X 100	46	63
M22 X 105	51	68
M22 X 110	56	73
M22 X 120	66	83
M22 X 130	76	93
M22 X 140	86	103
M22 X 150	96	113
M22 X 160	106	123
M22 X 170	116	133
M22 X 200	146	163

BOLT SIZE	MIN	MAX
M24 X 60	12	21
M24 X 65	13	26
M24 X 70	14	31
M24 X 75	15	36
M24 X 80	16	41
M24 X 85	29	46
M24 X 90	34	51
M24 X 95	39	56
M24 X 100	44	61
M24 X 105	49	66
M24 X 110	54	71
M24 X 115	59	76
M24 X 120	64	81
M24 X 125	67	86
M24 X 130	67	91
M24 X 140	77	101
M24 X 150	87	111
M24 X 160	97	121
M24 X 170	107	131
M24 X 180	117	141
M24 X 190	127	151
M24 X 200	137	161
M24 X 210	147	171
M24 X 220	157	181
M24 X 230	167	191
M24 X 240	177	201
M24 X 260	197	221
M24 X 280	217	241

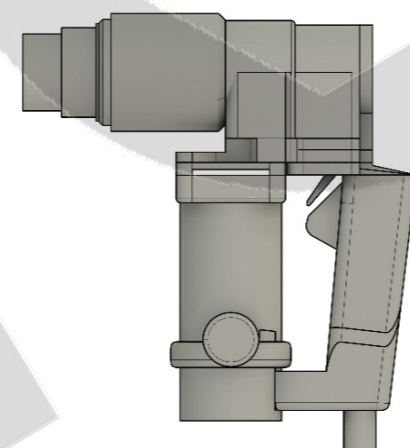
M27 X 70	10	26
M27 X 80	10	36
M27 X 90	27	46
M27 X 100	37	56
M27 X 110	47	66
M27 X 120	56	76
M27 X 130	66	86
M27 X 140	76	96
M27 X 150	86	106
M27 X 160	96	116
M27 X 170	106	126
M27 X 180	116	136
M27 X 190	126	146
M27 X 200	136	156

BOLT SIZE	MIN	MAX
M30 X 80	14	33
M30 X 90	14	43
M30 X 100	37	53
M30 X 110	47	63
M30 X 120	57	73
M30 X 130	67	83
M30 X 140	77	93
M30 X 150	87	103
M30 X 160	97	113
M30 X 170	107	123
M30 X 180	117	133
M30 X 190	127	143
M30 X 200	137	153
M30 X 210	147	163
M30 X 220	157	173
M30 X 240	177	193
M30 X 260	197	213
M30 X 280	217	233

M36 X 100	18	41
M36 X 110	26	51
M36 X 120	38	61
M36 X 130	48	71
M36 X 140	58	81
M36 X 150	68	91
M36 X 160	78	101
M36 X 170	88	111
M36 X 180	98	121
M36 X 190	108	131
M36 X 200	118	141
M36 X 210	128	151
M36 X 220	138	161
M36 X 240	158	181
M36 X 260	178	201
M36 X 280	198	221

*All measurements provided in mm

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Standard Style Shear Wrench

Notes:

1. Short bolts are fully threaded and applies to bolt lengths above the heavy line.

2. Should a grip still be below the min grip tolerance, additional washers can be placed under the bolt head or nut to adjust the grip thickness.

Notes from BS EN 1090-2:2018 section 8.2.2

Reference Min Grip: For preloaded bolts, at least four full threads (in addition to the thread run out) shall remain clear between the bearing surface of the nut and the unthreaded part of the shank.

Reference Max Grip: The length of protrusion shall be at least the length of one thread pitch measured from the outer face of the nut to the end of the bolt.